

Amendments To The Drawings:

The attached drawing sheet includes changes to FIG. 1.

Attachment: Replacement Sheet of FIG. 1

REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

Claims 1-20 are pending before this amendment. By the present amendment, claims 1, 3-4, 6, 9, 11, 13, 16-18, and 20 are canceled without prejudice; claims 2, 5, 10, 16, and 19 are amended. As a result of the present amendment, claims 2, 5, 7-8, 10, 12, 14-15, 16, and 19 remain pending. No new matter has been added.

In the office action (page 2), FIG. 1 stands objected to as not being labeled "PRIOR ART." A replacement sheet of FIG. 1 is attached in the appendix to this paper.

In the office action (page 3), claim 16 stands objected to for containing informalities. Appropriate correction as required in the office action has been made to claim 16, and withdrawal of the objection is respectfully requested.

In the office action (page 3) claims 1 and 9 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 2003/0137595 (Takachi). The "et al." suffix is omitted in a reference name in this paper.

Withdrawal of the rejection is requested at least since claims 1 and 9 have been cancelled without prejudice.

In the office action (page 4), claims 2, 10, 16, 17, and 19 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent App. Publ. No. 2003/0223008 (Kim).

As to claim 2 (currently amended to incorporate all limitations of claims 3-4), the applicants respectfully submit that Kim does not teach the original limitations of claim 2 as well as the added limitations of claim 3-4 incorporated therein.

Claim 2 states --the image pickup device is disposed in a substantially closed space formed by the **circuit board, the cover member, and the optical fiber**--. A problem occurs in the prior art when dust adheres to the surface of a solid image pickup device. The surface of the solid image pickup device is delicate, and it is therefore not easy to remove dust that has adhered to the surface. The present invention is able to solve this problem by disposing the image pickup device within a closed space formed by the circuit board, the cover member, and the optical fiber.

Kim does not teach the closed space formed in this manner. As can be seen in Kim FIG. 4 includes a substrate 1, an image signal processing package ('ISP') package 3, a filter 4, and a housing 5. That is, Kim requires an additional element to form what the examiner considers a closed space. More specifically, without the substrate 1, there would be no closed space in Kim. Kim's substrate 1 cannot be considered a circuit board in any way. In fact, in a later embodiment, Kim specifically discloses a flexible printed circuit board attached to the backside of the substrate (Kim [0017] at page 2). FIG. 4 clearly displays the circuit board 26 in the third embodiment of Kim.

In contradistinction, the claim 2 as originally recited teaches a substantially closed space that is formed by **a circuit board, the cover member, and the optical filter**. The original claim 2 thus does not require a substrate to form the closed in space. In fact, the set up of Kim would be quite detrimental to the present invention. If the closed in space were formed with a substrate in addition to an image signal processing package (as was done in Kim) it would be impossible to mount the present invention onto the mounting board 60 or 70 shown in FIGS. 7A and 7B of the present invention.

Accordingly, Kim does not teach the original claim 2. At least for this reason

alone, the applicants respectfully submit that claim 2 (although amended herein to incorporate additional limitations) is in condition for allowance. The applicants will address below the newly incorporated limitations according to the claims by which they were rejected.

As to claim 10 (currently amended to incorporate all limitations of claims 11 and 13), Kim does not teach this claim, for the same reasons described above. Namely, that Kim does not teach a closed space formed by the circuit board, the cover member, and the optical fiber.

At least for this reason, the applicants respectfully submit claim 10 is in condition for allowance. However, the newly added limitations will be addressed below.

As to claim 16-17, claim 16 has been amended to incorporate all limitations of claim 17, which is now cancelled. Kim does not teach the claim 16 with the newly added limitations. However, Claim 16 has been amended to clarify that --the cover member, optical filter, and circuit board form a substantially closed space--. As previously stated, Kim requires a filter, housing, image signal processing package, and a substrate to form its closed space.

At least for these reasons, the applicants respectfully submit claim 16 is in condition for allowance. However, the newly added limitations to claim 16 (from claim 17) will be addressed below.

As to claim 19 (currently amended to incorporate all limitations of claim 20), Kim does not teach this claim with the newly added limitations. However, the applicants also respectfully reassert the above argument since claim 19 has also been amended to

clarify that --the cover member, optical filter, and circuit board form a substantially closed space--. As previously argued, Kim does not teach this aspect of the invention.

At least for this reason, the applicants respectfully submit claim 19 is in condition for allowance. However, the newly added limitations (from claim 20) will be addressed below.

In the office action (page 8), claim 6 stands rejected under 35 U.S.C. §103(a) as being obvious over Takachi in view of U.S. Patent App. Publ. No. 2002/0167605 (Akimoto).

Withdrawal of the rejection is requested at least since claims 6 (and the base claim 1 from which claim 6 depends) have been cancelled without prejudice.

In the office action (page 8), claims 3-5 stand rejected under 35 U.S.C. §103(a) as being obvious over Kim in view of U.S. Patent No. 5,233,379 (Burnham) in view of U.S Patent No. 6,738,570 (Shinohara).

As to claims 3-4, the applicants respectfully submit that the limitations of claims 3-4 have been incorporated into claim 2, and that claim 2 as currently amended is still not taught or suggested by Kim, Burnham, and/or Shinohara, whether these references are considered individually or in any combination. The applicants respectfully resubmit the arguments made for claim 2 above, as neither Kim, Burnham, nor Shinohara teach or suggest that --the image pickup device is disposed in a substantially closed space formed by the circuit board, the cover member, and the optical filter--. As such, none of the references teach or suggest forming the closed in apace with

Although the applicants submit that claim 2 is allowable at least for the reasons

above, the applicants will now address the limitations of claim 3-4 that are incorporated into claim 2. Claim 2 as amended includes the limitation:

--wherein the cover member includes an air hole to make the substantially closed space in communication with the outside; the lens unit includes a ventilation channel; the air hole is in communication with the ventilation channel--.

The presently claimed invention provides an air hole in the cover member and a ventilation channel in the lens unit so that heat generated during the process of assembling the compact camera module can escape. Air expansion is thereby avoided by the presently claimed invention. By forming the compact camera module in this manner, it is possible to mount the module directly to a mounting board using a reflow process (specification page 16, lines 9-15). Additionally, by utilizing the ventilation channel there is a significant enough distance A (see FIG. 3A distance A) to keep solder from entering into the ventilation channel.

Additionally, using the techniques of the present invention, it is possible to seal the solid image pickup device 41 of the presently claimed invention from the outside. Therefore, as soon as the solid image pickup unit 40 is completed, the surface of the solid image pickup device is under protection. Therefore, under the current structure of the device, it is possible to reduce the amount of time during fabrication where the solid image pickup device is exposed to outside influences such as dust (specification page 11, lines 8-26).

The technique used in Burnham is quite different from the one utilized in the presently claimed invention. In Burnham, the bores 54 are formed in a housing interior wall 56. Burnham utilizes these bores to solve the problem of dust collecting in grooves and cracks and then getting sucked into the camera **during the camera's operation.**

The device of Burnham includes a flapper valve 64 to prevent air from flowing out of the air passage (Burnham column 3, lines 52-54). Burnham as understood teaches away from the presently claimed invention, in that Burnham is **restricting** the flow of air out of the air passage, while the present invention has a technique for allowing heat to **escape** its closed in space.

The flapper valve of Burnham would be quite detrimental if it were to be applied in the context of the present invention, as the present invention needs to allow heat generated during the process of assembling the compact camera module to escape. The inclusion of such a flapper valve of Burnham in the presently claimed invention would, of course, inhibit the escape of heat.

Additionally, Burnham does not recognize the problems identified and resolved in the present invention. As previously stated, the present invention is concerned with protecting the solid image pickup device from dust during the **manufacturing** process. By forming the closed in space, the presently claimed invention protects the solid image pickup device during the manufacturing process. However, when forming the device in a closed space, there becomes the problem of heat causing air expansion in the closed space. This is solved in the presently claimed invention through the air hole/ ventilation channel setup. None of Kim, Burnham, and Shinohara is concerned whatsoever with heat during the manufacturing process causing air expansion in the closed in area.

The presently claimed invention includes a ventilation channel in communication with the air hole in the cover member. This allows for greater distance between the opening 33b and the solid image pickup device. As previously stated, by increasing this distance, the presently claimed invention is able to restrict solder and dust from entering

the compact camera module and getting on the solid image pick-up device during the manufacturing process. None of the prior art references uses this technique to keep away solder.

Burnham contains no ventilation channel and is not concerned with keeping solder from its film 22. Shinohara and the prior art of Shinohara are only concerned with the maintaining pressure such that the lens-holding frame can be smoothly moved (Shinohara col. 1, lines 19-24), and providing vapor-resistance performance (Shinohara col. 1, lines 25-28).

Finally, claim 2 as amended incorporated the following limitation --wherein the ventilation channel is formed between a wall of a cutout of the lens and the lensholder--
The examiner points to the **holding frame** 6 of Shinohara FIG. 10 as the cutout of the lens in the presently claimed invention. However, this is a mischaracterization of the cutout of the lens in the presently claimed invention. The presently claimed invention uses the cutouts in order to easily form the ventilation channel without the extra work of processing (forming grooves, etc.) the lens holder. The cutouts 31a and 32a of the present invention are formed **in** the lenses.

In contradistinction, the "holding frame" the examiner points to in Shinohara is not a cutout **in** the lens. Shinohara's holding frame is instead a completely different portion, which holds the frame in place. For example, Shinohara's holding frame is not a cutout portion of the lens, but it is an arm that holds the lens in place. As can be seen in FIG. 10, the ventilation of Shinohara does not occur --between a wall of a cutout of the lens and the lens holder--. It instead occurs between a wall of a holding member (which holds the lens in place) and the peripheral wall 9e.

As can be seen, not all the elements of claim 2 have been taught by the cited prior art references, both for the reasons stated above in the claim 2 rejection argument and because the prior art does not teach --the ventilation channel is formed between a wall of a cutout of the lens and a lens holder--. Additionally, the present invention discloses different techniques and comes to a different result than those taught or suggested by the cited prior art references. Therefore, the presently claimed invention would not have been obvious to a person of ordinary skill at the time of the invention. For these reasons, the applicants that claim 2 (with claims 3 and 4 incorporated therein) is considered allowable. An indication of allowable subject matter with respect to claim 2 is respectfully requested.

As to claim 5, this claim is allowable at least since it depends from claim 2, which is now considered to be in condition for allowance for the reasons above.

In the office action (page 11), claim 7 and 12 stand rejected under 35 U.S.C. §103(a) as being obvious over Kim in view of Akimoto.

As to claim 7, the applicants respectfully submit that claim 7 is allowable at least since it depends from claim 2, which is now considered to be in condition for allowance for the reasons above.

As to claim 12, claim 12 is likewise allowable at least since it depends from claim 10, which is now considered to be in condition for allowance for the reasons above.

In the office action (page 13), claim 8 and 13 stand rejected under 35 U.S.C. §103(a) as being obvious over Kim in view of Akimoto.

As to claim 8, the applicants respectfully submit that claim 8 is allowable at least

since it depends from claim 2, which is now considered to be in condition for allowance for the reasons above.

As to claim 13, the limitations of this claim have been incorporated into claim 10. Claim 10 (now amended to incorporate all limitations of claims 11 and 13) is not taught or suggested by Kim or Akimoto. Neither Kim nor Akimoto teach or suggest that --the cover member is arranged to be in contact with the portion of the grounding terminal extending to the upper surface of the circuit board--. The terminals 11, which have the ground terminal 11a integrated therein, are formed at a peripheral portion (outside portion, see FIGS. 3 and 4) of the circuit board (Akimoto page 2, paragraph 28). As can be seen in FIG. 2, the grounding terminal is not in physical contact with the holder 34. FIG. 2 shows a gap between the grounding terminal and the holder 34, and the specification of Akimoto does not describe the holder 36 being in physical contact with the grounding terminal 11a.

The applicants respectfully submit that claim 10 is therefore allowable at least for the reasons described above (both in claim 10 and directly above). Additionally, the limitations of claim 11 (which have also been incorporated into claim 10) will be described below.

In the office action (page 15), claim 14-15 stand rejected under 35 U.S.C. §103(a) as being obvious over Shinohara in view of Takachi.

The applicants respectfully disagree.

As previously stated, the holding frame of Shinohara that the examiner points to is not a cutout in the lens. It is instead a completely different portion, which holds the frame in place. Therefore, the applicants respectfully resubmit the argument on the

cutouts of the lens found in claim 2.

Accordingly, neither Shinohara nor Takachi, considered individually or in combination, teaches or suggests the present invention of claim 14. An indication of allowable subject matter with respect to claim 1 is respectfully requested.

As to claim 15, the applicants respectfully submit that this claim is allowable at least since it depends from claim 14, which is now considered to be in condition for allowance for the reasons above.

In the office action (page 17), claim 11, 18, and 20 stand rejected under 35 U.S.C. §103(a) as being obvious over Kim in view of Burnham.

As to claim 11, the applicants respectfully submit that the limitations of claim 11 have been incorporated into claim 10. Claim 10 should be allowable over Kim and Burnham for the reasons stated above (i.e. Kim does not teach a closed space formed by the circuit board, cover member, and optical fiber, and Akimoto does not teach that the grounding terminal contact).

However, the applicants would also like to submit that the limitations of claim 11 that are inserted into claim 10 are allowable over Kim and Burnham. For much of the same reasons argued in claim 2 above, it would not have been obvious to a person of ordinary skill at the time of the invention to combine Kim and Burnham.

As previously stated, the technique used in Burnham is quite different from the one utilized in the presently claimed invention. Burnham's bores are used to solve the problem of dust collecting in grooves and cracks and then getting sucked into the **camera during the camera's operation.** The device of Burnham includes a flapper

valve 64 to prevent air from flowing out of the air passage (Burnham column 3, lines 52-54). As stated above, it appears as though Burnham teaches away from the presently claimed invention, in that Burnham is **restricting** the flow of air out of the air passage, while the present invention has a technique for allowing heat to **escape** its closed in space.

Accordingly, the applicants respectfully submit that claim 10 (with claims 11 and 13 incorporated therein) is allowable. An indication of allowable subject matter with respect to claim 10 is respectfully requested.

As to claim 18, claim 18 has been incorporated into claim 16. As described above, Kim does not teach claim 16 as amended, because Kim does not teach a cover member, optical filter, and circuit board forming a substantially closed space. As such, not all of the claim limitations of claim 16 have been taught, and at least for this reason, the applicants respectfully submit that claim 16 is allowable.

Additionally, the applicants would like to resubmit the arguments on the obviousness of forming the air hole in the cover member presented above for claim 11 and again in claim 2.

Accordingly, the applicants respectfully submit that claim 16 (with claims 17 and 18 incorporated therein) is allowable.

As to claim 20, this claim is incorporated into claim 19. As described above, Kim does not teach claim 19 as amended, because Kim does not teach a cover member, optical filter, and circuit board forming a substantially closed space. Instead, Kim teaches a **substrate**, in order to form what the examiner considers the closed space.

Therefore not all of the claim limitations of claim 19 are taught, and at least for this reason claim 19 should be allowable.

Additionally, the applicants would like to once again submit the arguments for the presently claimed invention being nonobvious over Kim and Burnham. The arguments can be found above in claim 11 and again in claim 2.

Accordingly, the applicants respectfully submit that claim 19 (with claim 20 incorporated therein) is allowable. An indication of allowable subject matter is respectfully requested.

For the reasons set forth above, the applicants respectfully submit that claims 2, 5, 7-8, 10, 12, 14-15, 16, and 19, now pending in this application, are in condition for allowance over the cited references. Accordingly, the applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit an indication of allowable subject matter.

This amendment is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns, the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,



W. William Park, Reg. No. 55,523
Ladas & Parry LLP
224 South Michigan Avenue
Chicago, Illinois 60604
(312) 427-1300

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APPENDIX OF ATTACHMENTS

**Replacement Sheet of FIG. 1
(a total of one sheet of drawings)**